Toxic Chemicals Update

An Environment Canada
Atlantic Region Newsletter
Volume 8 • Issue 1
October 2005
ISSN 1206-5455

In This Issue:

- Effectiveness of vegetated buffer zones in potato fields
- Seafood processing wastewater characterization
- Ecological risk to the marine environment associated with activities of former gold mining operations in N.S.
- Municipal Wastewater Effluents (MWWE)
- National Pollutant Release Inventory (NPRI) Update
- Chemical/ toxicity background database for the Atlantic Region

Legislation Update

- Regulations: export and import of hazardous wastes
- Codes of practice for road salt
- Notice with respect to certain hydrofluorocarbons
- Storage tanks regulations (post-consultation)
- PCB regulatory framework

Effectiveness of Vegetated Buffer Zones in Protecting Aquatic Life from Agricultural Runoff

The Toxics and Inventories Section in the Atlantic Region is in its final year of a 3-year Pesticide Science Fund project investigating the effectiveness of vegetated buffer zones in protecting aquatic life from agricultural runoff in Prince Edward Island's potato growing region. This study was undertaken to assess the provincial regulation that requires a 10 m vegetated buffer be maintained adjacent to water courses located adjacent to potato fields in an effort to reduce the potential for fish kills. For the past 3 years, Environment Canada has collected runoff samples at the edge of potato fields and various distances within the grassed buffer to capture runoff water following major precipitation events. Runoff is analyzed for concentrations of pesticide residues as well as toxicity to *Daphnia magna*. In the 2005 season, ten potato fields were selected for runoff collection and 3 rainfalls events have occurred which were sufficient for partial or complete sample collection. Once analytical results are available for the 2005 season, a report will be issued summarizing the project's main findings for the 3-year project. For more information regarding the project, contact Gary Julien (902-426-4486) or Allison Dunn (902-426-5037).

Characterization and Toxicity Testing of Seafood Processing Plant Wastewater in the Atlantic Provinces

Canada has one of the world's most valuable commercial fishing industries. In 2002, Canada exported 620,231 tonnes of fish products, valued at $4.7 billion. Fish and seafood processing is of national importance, with over 1100 processing plants nationwide. The number of seafood processing plants in Canada has continued to grow over the last few decades since only 460 seafood processing plants were enumerated in 1990. There are approximately 831 seafood processing plants in the Atlantic Provinces while both Ontario and British Columbia have approximately 223 facilities each. The province of Québec has over 80 seafood processing plants. Seafood processing facilities in Canada range in size from a few employees to over one thousand employees. During 2001, 30,000 workers were employed by seafood processors in Atlantic Canada.

Historically, the characterisation of the effluent from seafood processing has focused mainly on a few conventional characteristics such as biochemical oxygen demand, total suspended solids, nitrogen and oil and grease. Furthermore, only a few studies have looked at the toxicity of this type of effluent. Therefore, little is known about the overall potential impact of those wastes to the environment.

To enable a better understanding of seafood processing and its potential impacts on the environment in Atlantic Canada, Environment Canada- Atlantic Region conducted an enhanced wastewater characterization study of seafood processing plant effluents from 2003 to 2005. To August 2005, 16 plants have participated in the study.

Final wastewater samples from the seafood processing plants were collected for toxicity testing and physico-chemical analyses. Toxicity tests performed on the samples included a Microtox™ acute test, a sea urchin fertilization test, a threespine stickleback survival test, a rainbow trout acute lethality tests and a seven day growth and survival test using inland silversides. Physico-chemical analyses conducted included: ammonia, biochemical oxygen demand, total organic carbon, total solids, total suspended solids, hardness, total nitrogen, nitrate, nitrite, total phosphorus, conductivity, oil and grease, total and trace mercury.

Results from all of the individual laboratory tests combined demonstrate that:

39% of the wastewater showed no adverse effects to any organisms in undiluted effluent (100% effluent).

16% of the wastewater showed adverse effects to organisms at concentrations

ranging from 50- 100% of the undiluted effluent

19% of the wastewater showed adverse effects to organisms at concentrations ranging from 25- 50% of the undiluted effluent

25% of the wastewater showed adverse effects to organisms at concentrations ranging from 0- 25% of the undiluted effluent

No obvious link between chemical parameters of the wastewater and the results of the toxicity tests have been detected so far. Due to the wide variety of species landed and processed in this region, there are some types of processing for which we do not possess any data. Therefore the next step in this project is to continue to sample seafood processing wastewater in processing plants in the Atlantic Region to fill in these data gaps. A final report should be published by the fall of 2006.

For further information on this project, please contact Benoit Lalonde at (902) 426-2295 or benoit.lalonde@ec.gc.ca

Ecological Risks to the Marine Environment Associated with Activities of Former Gold Mining Operations in NS

From about 1860 to 1940, gold was produced from 64 mining districts in Nova Scotia. At that time, most of the gold was recovered using mercury amalgamation techniques. The waste from the milling process (tailings), were contaminated by mercury as a result of losses in the process and were also often high in other naturally occurring metals such as arsenic. These tailings were often deposited directly into natural water bodies or into low lying areas next to water bodies.

In 2003, Natural Resources Canada initiated a study to examine the distribution of metals surrounding 11 former gold mines in Nova Scotia. Project partners included Geological Survey of Canada-Ottawa, Nova Scotia Department of Natural Resources, Geomatics Canada, and several universities. The field studies confirmed that most of these sites contain large volumes of unconfined tailings which, in some cases, have been transported large distances offsite through local drainage systems. The study also showed that the gold mine tailings contain elevated levels of mercury, arsenic and other metals.

In 2004, the Seal Harbour gold mine district located on the eastern shore of Nova Scotia was selected for a more comprehensive multidisciplinary follow-up study. Environment Canada was invited to participate in that follow-up study to help assess environmental impacts associated with the contaminants present at the site. Analysis of the environmental data shows elevated levels of arsenic and mercury in sediment samples, some sediment toxicity, lower numbers and biomass in benthic biota and significant uptake of arsenic in marine soft shell clams. The high concentrations of arsenic in the clam tissues have led to a shellfish harvesting closure of the areas between Isaacs Harbour and Seal Harbour.

In 2005, a multi-stakeholder advisory committee has been created, led by the Nova Scotia Department of Environment & Labour, with participation of the federal and provincial departments of health, natural resources, environment and fisheries. Environment Canada (EPB and ECB) is currently leading a study to assess potential ecological risks to the marine ecosystem at Seal Harbour and 8 other former gold mining sites (Figure 1).

Figure 1. July 11 – 13, 2005 gold mine tailings sampling locations

Samples were collected on July 11-13, 2005 and results are pending. In addition to assessing ecological impacts, Environment Canada continues to work closely with DFO and the Canadian Food Inspection Agency (CFIA). EC will continue to share any information gathered that could be used by DFO and CFIA to identify shellfish harvesting areas that may be contaminated from gold mine tailings, allowing proper action to be taken to protect public health. For further information, please contact: Rita Mroz 426-9064.

Municipal Wastewater Effluents (MWWE)

The nomination of ammonia dissolved in water, inorganic chloramines and chlorinated wastewater effluents to the List of Toxic Substances under the *Canadian Environmental Protection Act, 1999*, (CEPA 1999) in 2001 initiated regulatory action towards MWWE, which were identified as a priority for risk management. Under CEPA, the Environment Minister was required to propose a preventive or control instrument for these substances. Environment Canada recognized that addressing the risks associated with municipal wastewater effluents is complex and that a first step towards immediate action needed to be flexible and set in the context of a long-term strategy. This step was the publication in December 2004 of a Notice requiring pollution prevention planning for chlorine and a Notice of a guideline for the release of ammonia involving facilities (http://www.ec.gc.ca/CEPARegistry/default.cfm) discharging greater than 5,000 cubic meters per day of wastewater effluent to surface water.

During the development of and consultations on the Notices, the Canadian Council of Ministers of the Environment (CCME) decided to take a broader look at MWWE. Environment Canada is now working with provinces and territories and other stakeholders through the CCME to develop a Canada-wide Strategy for the management of wastewater effluents. The Strategy, to be completed by December 2006, will provide collectively agreed-to performance standards, a regulatory baseline that includes a site-specific risk element, and a harmonized regulatory framework to address governance issues for the sector. Further consultations with interested parties on a draft Strategy will take place in Spring 2006.

Each jurisdiction will implement the Strategy using its own legal tools. Environment Canada intends to develop a regulation under the Fisheries Act as its principal instrument to implement the Canada-wide Strategy. This regulation will include specific performance standards for the release of wastewater effluent to surface water from all wastewater systems across Canada including those belonging to the federal government and aboriginal communities. Other instruments to ensure that federal lands and aboriginal lands have a

comparable level of environmental protection for wastewater effluents compared with provinces and territories, may also be developed.

For further information please contact John Clarke at (902) 426-6135 or john.clarke@ec.gc.ca

National Pollutant Release Inventory (NPRI) Update

The National Overview Report and Informing Canadians report for the 2003 NPRI will be published in November 2005. The data for the calendar year 2003 is currently available on the NPRI website and the preliminary 2004 data is also accessible on the web site www.ec.gc.ca/npri/.

The reporting requirements for the 2004 reporting year were very similar to the 2003 reporting year. As part of the 2004 NPRI reporting year, facilities were given the option of completing their NPRI report online and the vast majority of reporting facilities elected to complete and submit their reports via the online system. The NPRI along with its partners (the Ontario Ministry of the Environment, British Columbia Ministry of Environment, Lands and Parks, Greater Vancouver Regional District, Alberta Environment, Environment Canada's Environmental Emergencies Regulations and Environmental Performance Agreements, and the Canadian Chemical Producers' Association) launched the One-Window National Environmental Reporting System (OWNERS). Eventually this will allow facilities to submit reports to all of the partners' programs through a single reporting form, eliminating the need to update frequently-requested information for each program. OWNERS was operational in early 2005. Development and enhancement of the OWNERS system is continuing.

Reports were received from 11 new facilities within the Atlantic Region. The new reports were submitted by quarries, asphalt plants, manufacturing plants and gas turbine stations.

The 2005 NPRI reporting requirements were outlined in a *Canada Gazette* notice published in February 2005. Changes to the reporting requirements for the 2005 reporting year are minor. Quantities of 323 substances released onsite, recycled, disposed of onsite and disposed of off site by industrial facilities in 2005 must be submitted to Environment Canada on or before June 1, 2006. This data will be released to the public soon after. For More information on the NPRI please visit the web site at www.ec.gc.ca/npri/

Or contact the Atlantic Region at:
NPRI_ATL@ec.gc.ca
Jeff Stobo (902) 426-4805
Colleen McNeil (902) 426-5777

Chemical/Toxicity Background Database for the Atlantic Region

"Background chemical concentrations", "reference soil", and "reference site" are frequently used in evaluating the environmental impacts of contaminants on water, soil and sediment quality at contaminated sites. While both British Columbia and Ontario have established protocols and databases of background chemical data within those provinces, to date, there is only limited background data that exists for the Atlantic Region. Recognizing the value of such reference/background data in the ecological risk assessment process, Environment Canada is now developing a database containing soil toxicity data and heavy metal/organic chemical data of soils collected from reference areas around the Atlantic Region.

A pilot study was undertaken in 2004/05 to meet two objectives: to map the four Atlantic Provinces into specific soil zones based on geochemistry, land-use, climate, etc. in order that each zone can be characterized and background data could be calculated for each specific zone (see Fig 1). The second objective was to develop a sampling protocol that would be utilized at each site to ensure that representative sample is collected.

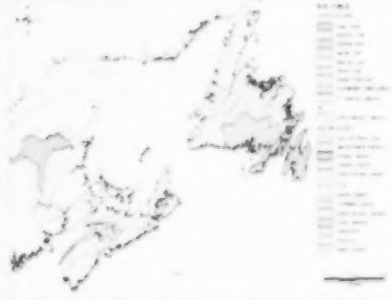

Figure 1 – Soils zone of Atlantic Canada

With the map and the sampling protocol now developed, the objective for 2005/06 is to begin sampling and to start populating the database. Future goals will be to include the collection of sediment samples to develop background sediment quality for the Atlantic Region.

Contact: Rita Mroz (902) 426-9064

Legislation Update

The Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations

The *Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations* (the "Regulations") were published in Canada Gazette Part II on June 1st, 2005 and will come into force on November 1st, 2005. These Regulations will revoke and replace the current *Export and Import of Hazardous Wastes Regulations*, pursuant to the Canadian Environmental Protection Act, 1999 (CEPA, 1999).

Upcoming information sessions are intended to be provided in the fall 2005 across Canada to facilitate the understanding of, and compliance with, the revised Regulations. These sessions will provide both a general overview of the Regulations, outlining maintained and new regulatory requirements and how they could affect your operations, as well as more detailed information and examples on topics, such as: identification and classification, notification, approval process, and transboundary and post movement provisions. The sessions will be targeted for:

- exporters, importers, carriers, receivers, customs brokers and shipping agents
- regulatory authorities, port authorities, customs officers and associations involved in the export, import, or transit of hazardous wastes or hazardous recyclable materials.

For additional information or documentation regarding the Regulations, please contact Marie-Josée Sirois at (902) 426-3574, by fax at (902) 426-3897, by e-mail at marie-josee.sirois@ec.gc.ca, visit the Transboundary Movement Branch website at

http://www.ec.gc.ca/tmb or the CEPA Environmental Registry website at http://www.ec.gc.ca/CEPARegistry.

CODE OF PRACTICE FOR THE ENVIRONMENTAL MANAGEMENT OF ROAD SALTS

On April 5, 2004 the Minister of the Environment, David Anderson, announced the release of the Code of Practice for the Environmental Management of Road Salts. The Code of Practice recommends that road authorities prepare salt management plans that identify actions they will take to improve their practices in salt storage, general use on roads and snow disposal.

Since the publication of the Code many road authorities in the Atlantic Region have indicated their intent to develop Salt Management Plans and many are currently in the process of implementing those plans. The participation of road authorities is tracked by Environment Canada and made publicly available at: http://www.ec.gc.ca/nopp/roadsalt/codeImpl/en/codeImpl.cfm

In order to evaluate whether or not the Code is effective in reducing the impact of road salts on the environment road authorities subject to the Code are asked to provide reports that include information on salt use, status of the BMP implementation, environmental monitoring conducted. Those reports are to be provided to Environment Canada by the end of June of each year. The reporting form is available on-line at: http://www.ec.gc.ca/nopp/roadsalt/cop/guide/en/index.cfm

In order to assist road authorities with the development of Salt Management Plans and to keep them updated on the program Environment Canada now publishes a newsletter which is available at: http://www.ec.gc.ca/nopp/roadsalt/codeImpl/en/update_August05.cfm

Parks Canada has developed a Salt Management Plan (SMP) for the Cape Breton Highlands National Park in an effort to reduce the environmental impact of road salt used in the park. As part of the SMP Parks Canada, in cooperation with Environment Canada, has conducted baseline environmental sampling of surface water, groundwater and soils to determine the extent of impact from current road salts management practices. Sampling locations were selected, in part, based on Parks Canada's recent identification of salt vulnerable areas using national park ecological data and GIS. Additional annual sampling will be conducted over the next three years to monitor improvements to the health of the environment with the implantation of the SMP.

Other information on road salt and Environment Canada's road salt Compliance Promotion program can be found on our website at: http://www.ec.gc.ca/nopp/roadsalt/en/index.cfm or from the Atlantic Regional Office of Environment Canada at: Christine.garron@ec.gc.ca.

NOTICE WITH RESPECT TO CERTAIN HYDROFLUOROCARBON*

On April 16, 2005 a Notice was posted in *Canada Gazette Part I* requiring the provision of information related to certain hydrofluorocarbons (HFCs) in order to assess toxicity, amongst other things. If your facility "manufactured, imported, exported or purchased... more than 100 kilograms" of HFCs, whether alone or in mixture, you may be required to provide information to the Minister by June 30, 2005. For further information on what information is required and who must furnish it, review the Notice online at: http://canadagazette.gc.ca/partI/2005/20050416/html/index-e.html

STORAGE TANKS REGULATIONS (POST-CONSULTATION)*

Publication of the proposed storage tanks regulations in Canada Gazette Part I is now expected in the Fall of 2005. Subsequent to consultation, which took place in 2003, the regulations underwent revision. There will be an opportunity to comment on the proposed regulations, including the revisions, during the 60-day comment period which commences with publication in Canada Gazette Part I. For further information visit the storage tanks website at: http://www.ec.gc.ca/st-rs/.

The main objective of the proposed regulation is to prevent soil and groundwater contamination from storage tank systems located on federal and aboriginal lands. The proposed regulation will also enhance the level of environmental protection regarding federal petroleum products and allied petroleum products storage tank systems, to be more in line with those regulations that already exist in most provincial and territorial jurisdictions.

For further information contact: Anne MacKinnon (902) 426-5104

PCB REGULATORY FRAMEWORK*

The proposed amendments to the *Chlorobiphenyls Regulations*, the *Storage of PCB Material Regulations* and the *Mobile Destruction of PCBs Regulations* are slated to be published in *Canada Gazette Part I* in the Fall of 2005. The proposed changes would include specific deadlines for ending the use of PCBs and destroying PCBs in storage. The proposed revisions would also introduce new labelling requirements and provisions for reporting the destruction of PCBs in storage and reporting the destruction of the remaining PCBs in use.

In March, Environment Canada posted the Federal PCB Regulatory Framework which outlines the department's approach to updating regulation of PCBs. That report is available online at: http://www.ec.gc.ca/pcb.

Note to Readers:

In an attempt to reduce waste, Environment Canada is encouraging the use of electronic means to view this newsletter. You may request to receive an electronic version by email. If you presently receive a hard copy of this newsletter, and are able to access an electronic copy, please contact Benoit Lalonde at benoit.lalonde@ec.gc.ca to add your name, or any other person to which this newsletter would be usefull, to the e-mail list.

Toxic Chemicals Update is published by the Toxics and Inventories Section of Environment Canada, Atlantic Region.

Editor:
Benoit Lalonde
Environment Canada
16th floor, Queen Square
45 Alderney Drive
Dartmouth, NS
B2Y 2N6

Tel: (902) 426-2295
Fax: (902) 426-8373